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Engineering Survival Skills: Keeping a Lab Notebook

July 7, 2016

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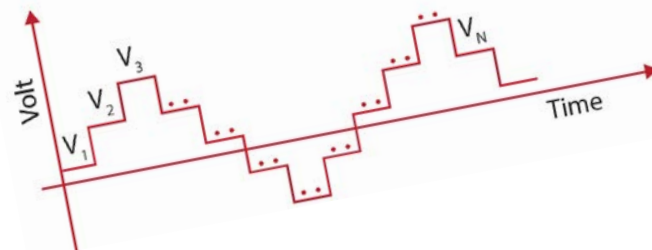
Keeping a Lab Notebook

Executing experiments
...safety first!

! DANGER

Documenting experiments

- Purpose of a lab notebook
- Information to be conveyed
- Study case



Successful research!

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Executing experiments – Safety

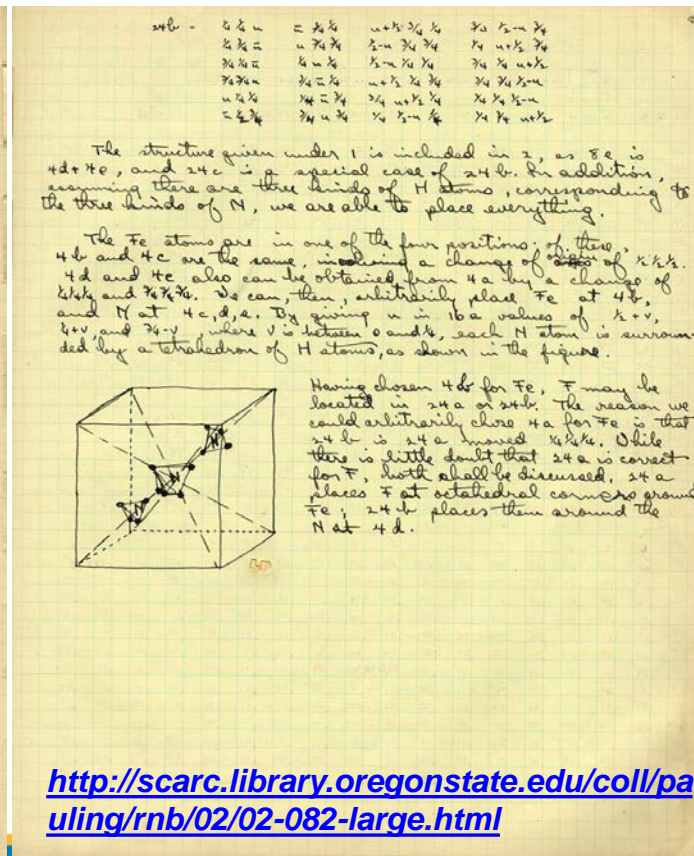
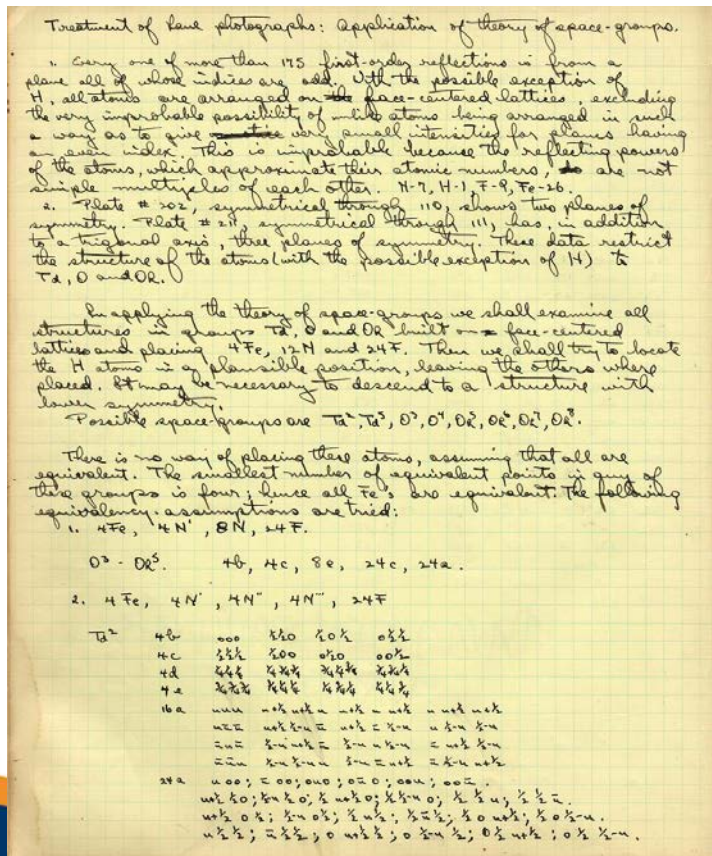
- Always remember:
 - proper training is required to work in a lab
 - the Integrated Work Document (IWD) must be read, signed and obeyed
- An experiment needs to be planned in advance:
 - define your goals
 - plan your activity
 - think about all the possible risks and take appropriate actions for mitigation

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Lab Notebook – What it is

- A lab notebook is a complete record of information that enables another engineer or scientist to reproduce your observations



Example:

Notebook of Linus Pauling considered one of the greatest scientists of the 20th century

<http://scarc.library.oregonstate.edu/coll/pauling/rnb/02/02-082-large.html>

Lab Notebook – What it is

- A lab notebook includes:
 - test procedures, conditions of the test or measurement, changes to the test bed, schematics, analysis, and data to pass on to other researchers
 - explanations of why experiments were initiated, how they were performed, and the results
- A lab notebook is also:
 - a prime source for writing a dissertation or a paper
 - a legal document to prove patents and defend your data against accusations of fraud
 - a scientific legacy in the lab

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Lab Notebook – What it is NOT

- A journal for your scientific or personal musings
- A record of communications you have with your mentor or lab-mates (this is important too but could be just a daily journal)
- A place to compile lab protocols/manuals
- Yours to take home

A notebook never leaves the lab. Copies are allowed

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Lab Notebook – What goes in it!

- Notebook name
- Inside cover or cover page
 - Your name and year
 - General project name
 - Lab mailing address (ask your mentor for Mail Stop details)

*Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545*

- Table of contents

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Lab Notebook – Recommendations

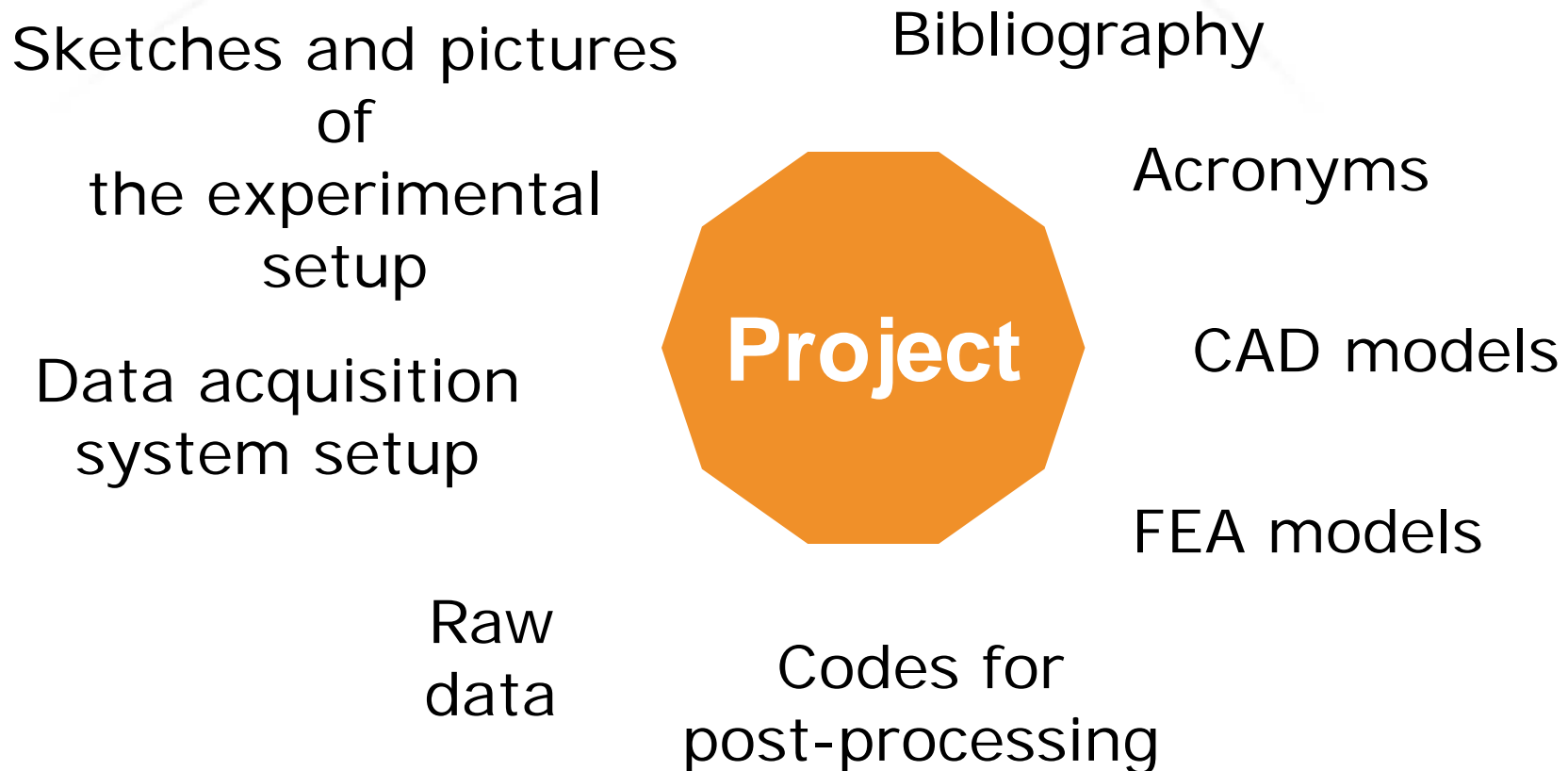
- Use a bound notebook, not loose sheets of paper
- Make sure your notebook has numbered pages
- Use pen as a permanent record
- Date every page, and record the time of the day for each important entry
- Always write directly into your log; NEVER work on loose scraps of paper, and then copy things into the book (if needed glue or tape in graphs or other information)
- If you discover that something was wrong, cross out or strikethrough the text so that it is clearly marked as being in error, but is still legible.

Even “mistakes” turn out to be important!

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Lab Notebook – Collect and share information for a complex project

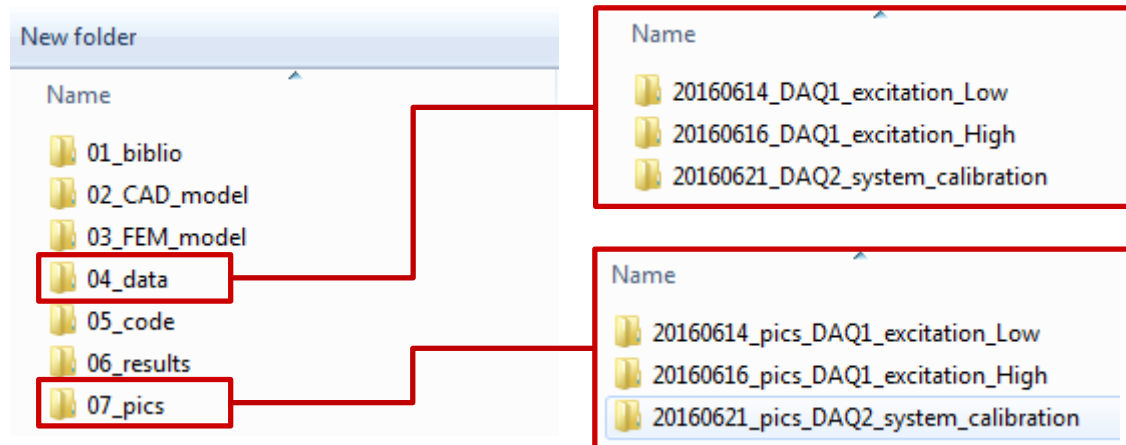


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Lab Notebook – Collect and share information for a complex project

Organize project's material in folders and use the lab notebook to clearly reference everything!

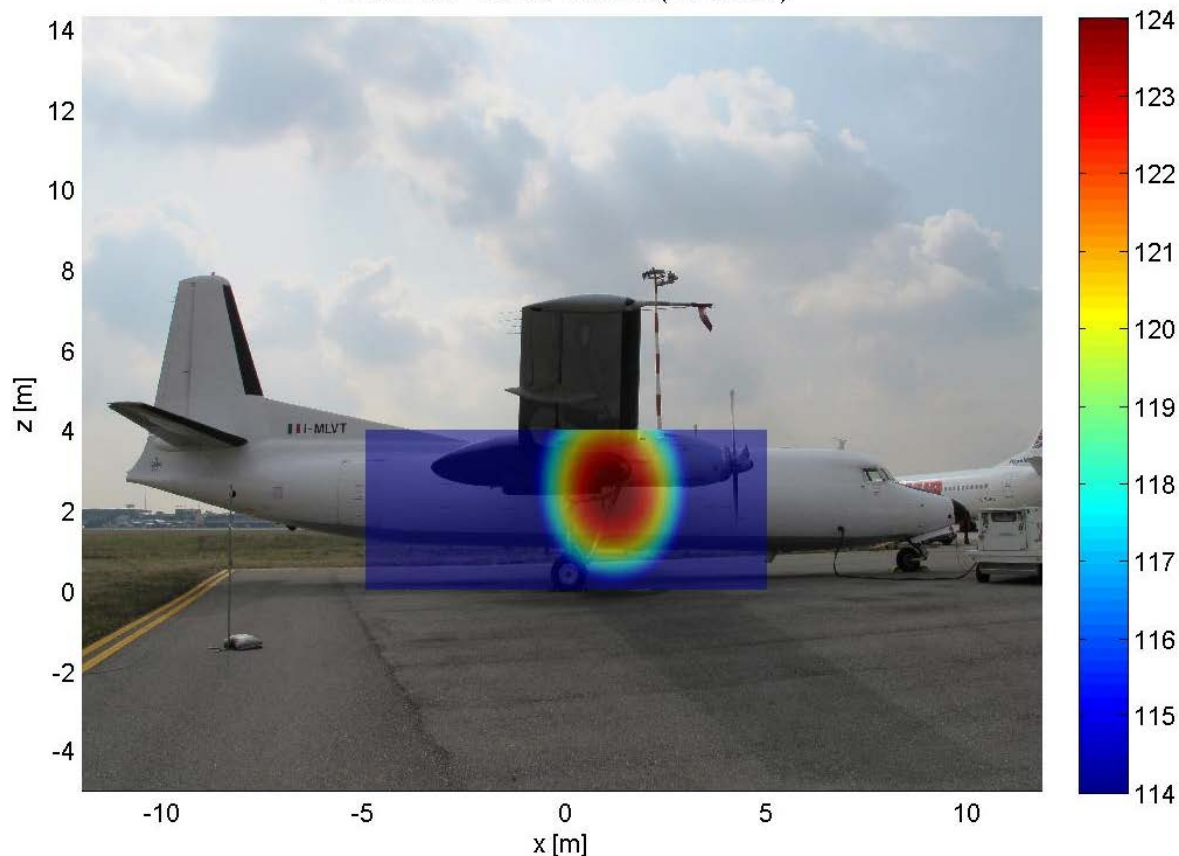


Example

- For data stored in “04_data\20160616_DAQ1_excitation_High” provide information about DAQ1 settings
- Further comments can be formulated by referencing specific pictures stored in the folder
“20160616_pics_DAQ1_excitation_High”

Lab Notebook – Study case

Prova micro - banda 1000 Hz (1/3 ottava)



Be ready
for unforeseen
events!

Acoustic characterization of a Fokker-F27
Courtesy of Politecnico di Milano

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Lab Notebook – Information content

“A lab notebook is a complete record of information that enables another engineer to reproduce your observations”

As students and early career engineers, please think about all the information you should include to enable your mentor to successfully continue on the project when you will leave the lab!!

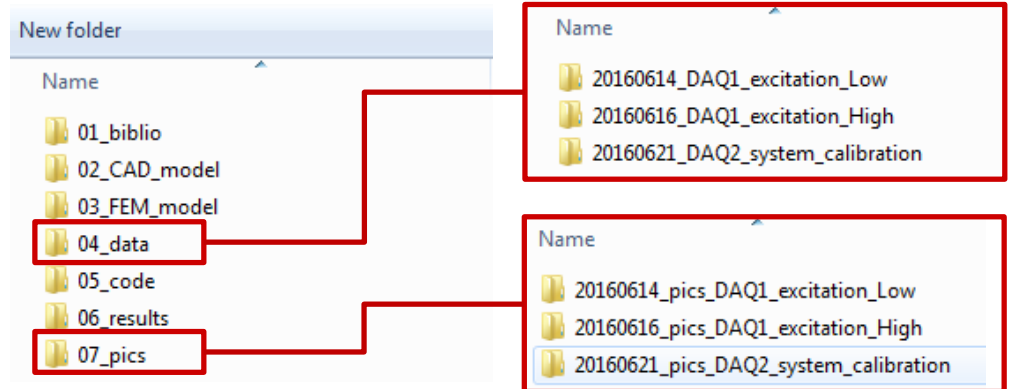
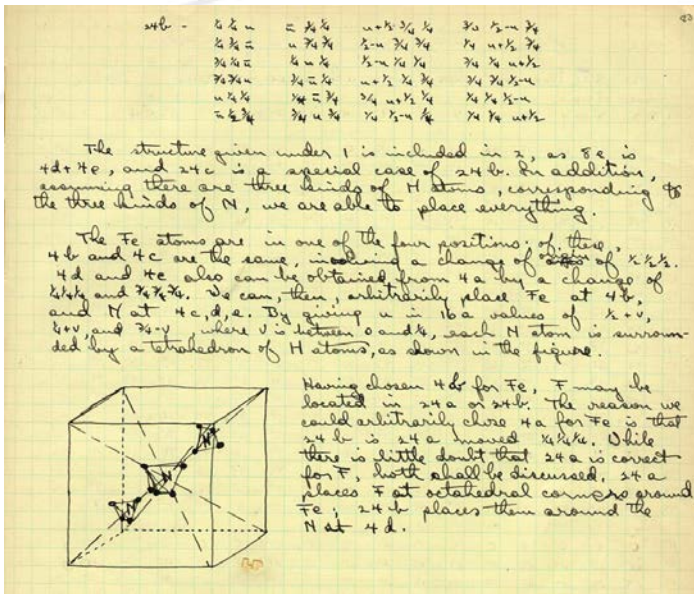
Impress your mentor by keeping careful notes on a daily basis!

Be diligent!

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Questions



Sketches and pictures of
the experimental
setup

Bibliography

Acronyms

Data acquisition
system setup

Project

CAD models

FEA models

Raw
data

Codes for
post-processing

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